

Chpt 7 Study Guide

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Simplify $(-3)^{-3}$.

a. $\frac{1}{27}$	c. 9
b. -27	d. $-\frac{1}{27}$
- _____ 2. Write 100 as a power of 10.

a. 10^2	c. 10^3
b. 10^1	d. 10^{-2}
- _____ 3. Write 0.00001 as a power of 10.

a. 10^5	c. 10^{-4}
b. 10^{-6}	d. 10^{-5}
- _____ 4. Find the value of the expression 74×10^{-4} .

a. 0.074	c. 0.00074
b. -2,960	d. 0.0074
- _____ 5. The planet Saturn has an average distance from the sun of about 886,500,000 miles. Write this number in scientific notation.

a. 8.865×10^7	c. 0.8865×10^9
b. 8.865×10^8	d. 88.65×10^7
- _____ 6. Simplify $(-2) \cdot (-2)^6$.

a. -14	c. Cannot simplify
b. $-\frac{1}{128}$	d. -128
- _____ 7. Simplify $m^{10} \cdot y^2 \cdot m^{-8}$.

a. $m^{-80} \cdot y^2$	c. $(m \cdot y)^4$
b. $m^{18} \cdot y^2$	d. $m^2 \cdot y^2$
- _____ 8. Simplify $(m^2 n^{-2})^2 (-m^{-3} n^3)^3$.

a. $-\frac{n^5}{m^5}$	c. $-\frac{1}{m^{36} n^{36}}$
b. $-m^4 n^6$	d. $-\frac{n^{108}}{m^{108}}$
- _____ 9. Simplify $\frac{4^5}{4^2}$.

a. 2.5	c. 64
b. 16,384	d. Cannot simplify
- _____ 10. Simplify $\frac{2^4}{2}$.

a. 4	c. 8
b. Cannot simplify	d. 32

- ____ 11. Simplify $(6.3 \times 10^8) \div (9 \times 10^4)$ and write the answer in scientific notation.
- 7×10^3
 - 7×10^{12}
 - 70
 - 7×10^5
- ____ 12. Write the polynomial $6x^2 - 15x - 9x^5 - 7x^3 - 5x^4 - 11$ in standard form. Then give the leading coefficient.
- $-11 - 15x + 6x^2 - 5x^3 - 7x^4 - 9x^5$
The leading coefficient is -11 .
 - $-9x^5 - 5x^4 + 6x^3 - 7x^2 - 15x - 11$
The leading coefficient is -9 .
 - $-11 - 15x + 6x^2 - 7x^3 - 5x^4 - 9x^5$
The leading coefficient is -11 .
 - $-9x^5 - 5x^4 - 7x^3 + 6x^2 - 15x - 11$
The leading coefficient is -9 .
- ____ 13. A toy rocket is launched from a platform 49 feet above the ground at a speed of 84 feet per second. The height of the rocket in feet is given by the polynomial $-16t^2 + 84t + 49$, where t is the time in seconds. How high will the rocket be after 3 seconds?
- 157 feet
 - 2605 feet
 - 253 feet
 - 108 feet
- ____ 14. Subtract.
- $$(10a^3 - a) - (a^3 + 7a - 2)$$
- $10a^3 + 7a - 2$
 - $9a^3 - 8a$
 - $10a^3 - 8a - 2$
 - $9a^3 - 8a + 2$
- ____ 15. Multiply.
- $$\left(\frac{2}{3}x^3r^2\right)(r^4s^4)(6x^2s^3)$$
- $\frac{2}{3}x^5r^6s^7$
 - $\frac{2}{3}x^6r^8s^{12}$
 - $4x^6r^8s^{12}$
 - $4x^5r^6s^7$
- ____ 16. Multiply.
- $$5x^3y^5(5x^3 + 5xy^3)$$
- $5x^7y^6 + 5x^5y^9$
 - $25x^9 + 25x^3y^{15}$
 - $10x^6y^5 + 10x^4y^8$
 - $25x^6y^5 + 25x^4y^8$
- ____ 17. Multiply.
- $$8ab^2(a^5b^2 - 2a^2b^3)$$
- $9a^6b^4 + 6a^3b^5$
 - $8a^7b^5 + 8a^4b^6$
 - $8a^5b^4 - 16a^2b^6$
 - $8a^6b^4 - 16a^3b^5$
- ____ 18. Multiply.
- $$-6x^5y(2x^4 + 4x^3y)$$
- $-12x^9y - 24x^8y^2$
 - $-4x^9y - 2x^8y^2$
 - $-12x^{20}y^1 - 24x^{15}y^1$
 - $-6x^{10}y^2 - 6x^9y^3$
- ____ 19. Multiply.

$$(3x + 2y)^2$$

a. $9x^2 + 6xy + 4y^2$

b. $6x^2 + 4y^2$

c. $9x^2 + 12xy + 4y^2$

d. $9x^2 + 4y^2$

_____ 20. Multiply.

$$(y + 10)(y - 10)$$

a. $y^2 - 10y + 100$

b. $2y - 20$

c. $y^2 - 100$

d. $y^2 + 20$

Chpt 7 Study Guide

Answer Section

MULTIPLE CHOICE

1. ANS: D

$$(-3)^{-3} = \frac{1}{(-3)^3}$$

The reciprocal of -3 is $\frac{1}{(-3)}$.

$$= -\frac{1}{27} \quad (-3)^3 = -27.$$

	Feedback
A	Check the sign of your answer. A negative exponent does not affect the sign of the answer.
B	A nonzero number raised to a negative exponent is equal to 1 divided by that number raised to the opposite (positive) exponent.
C	A nonzero number raised to a negative exponent is equal to 1 divided by that number raised to the opposite (positive) exponent.
D	Correct!

PTS: 1 DIF: Average REF: Page 447 OBJ: 7-1.2 Zero and Negative Exponents
 NAT: 12.1.1.d TOP: 7-1 Integer Exponents
 KEY: negative exponent | evaluate | power | exponent

2. ANS: A

The decimal point is 2 places to the right of 1, so the exponent is 2.
 $100 = 10^2$

	Feedback
A	Correct!
B	Count the number of decimal places to the right of 1.
C	Count the number of decimal places to the right of 1.
D	The number is greater than 1, so the exponent is positive.

PTS: 1 DIF: Basic REF: Page 453 OBJ: 7-2.2 Writing Powers of 10
 NAT: 12.1.1.f TOP: 7-2 Powers of 10 and Scientific Notation
 KEY: write | exponents | power | powers of 10

3. ANS: D

The decimal point is 5 places to the left of 1, so the exponent is -5 .
 $0.00001 = 10^{-5}$

	Feedback
A	The number is less than one, so the exponent is negative.
B	Count the number of decimal places to the left of 1. The exponent is the opposite of that number.
C	Count the number of decimal places to the left of 1. The exponent is the opposite of that number.

D	Correct!
----------	----------

PTS: 1 DIF: Basic REF: Page 453 OBJ: 7-2.2 Writing Powers of 10
 NAT: 12.1.1.f TOP: 7-2 Powers of 10 and Scientific Notation
 KEY: write | exponents | power | powers of 10

4. ANS: D

Move the decimal point 4 places to the left.
 0.0074

	Feedback
A	Move the decimal point the correct number of places.
B	For powers of 10, the exponent tells the number of places to move the decimal point.
C	Move the decimal point the correct number of places.
D	Correct!

PTS: 1 DIF: Average REF: Page 453 OBJ: 7-2.3 Multiplying by Powers of 10
 NAT: 12.1.1.f TOP: 7-2 Powers of 10 and Scientific Notation
 KEY: exponents | multiplication | power | powers of 10

5. ANS: B

To write 886,500,000 in scientific notation, count the number of places to move the decimal point to get a number between 1 and 10. The number of places to move the decimal point is the exponent. If you move the decimal point to the left, the exponent is positive.

To move the decimal point between the first 8 and the second 8, move the decimal point 8 places to the left.

$$886,500,000 = 8.865 \times 10^8$$

	Feedback
A	The exponent should be equal to the number of places the decimal point is moved.
B	Correct!
C	The number that multiplies the power of 10 should be greater than or equal to 1 and less than 10.
D	The number that multiplies the power of 10 should be greater than or equal to 1 and less than 10.

PTS: 1 DIF: Average REF: Page 454 OBJ: 7-2.4 Application
 NAT: 12.1.1.f TOP: 7-2 Powers of 10 and Scientific Notation
 KEY: exponents | scientific notation | standard notation

6. ANS: D

To multiply powers with the same base, keep the same base and add the exponents. Then, evaluate the power.

$$(-2) \cdot (-2)^6 = (-2)^7 = -128$$

	Feedback
A	The exponent tells how many times to multiply the base number by itself.
B	Check the sign of the exponent.
C	If the bases are the same, add the exponents. Then evaluate the power.
D	Correct!

PTS: 1 DIF: Basic REF: Page 461 OBJ: 7-3.1 Finding Products of Powers
 NAT: 12.5.3.c TOP: 7-3 Multiplication Properties of Exponents
 KEY: evaluate | product | multiply | power | exponent

7. ANS: D

To multiply powers with the same base, keep the same base and add the exponents.

$$m^{10} \cdot y^2 \cdot m^{-8} = (m^{10} \cdot m^{-8}) \cdot y^2 = m^2 \cdot y^2$$

	Feedback
A	To multiply powers with the same base, add the exponents, not multiply.
B	To multiply powers with the same base, add the exponents, not subtract.
C	Rewrite only powers with the same base. Do not combine powers with different bases.
D	Correct!

PTS: 1 DIF: Average REF: Page 461 OBJ: 7-3.1 Finding Products of Powers
 NAT: 12.5.3.c TOP: 7-3 Multiplication Properties of Exponents
 KEY: evaluate | product | multiply | power | exponent

8. ANS: A

$$\begin{aligned} & (m^2 n^{-2})^2 (-m^{-3} n^3)^3 \\ & (m^4 n^{-4})(-m^{-9} n^9) \\ & -(m^4 m^{-9})(n^{-4} n^9) \\ & -m^{-5} n^5 \\ & -\frac{n^5}{m^5} \end{aligned}$$

Use the Power of a Power Property.

Use the Associative and Commutative Properties.

Add the exponents.

Write with a positive exponent.

	Feedback
A	Correct!
B	A power raised to a power is equal to the base raised to the product of the exponents.
C	To find the product of two powers with the same base, add the exponents.
D	A power raised to a power is equal to the base raised to the product of the exponents. To find the product of two powers with the same base, add the exponents.

PTS: 1 DIF: Advanced REF: Page 463 OBJ: 7-3.4 Finding Powers of Products
 NAT: 12.5.3.c TOP: 7-3 Multiplication Properties of Exponents

9. ANS: C

To divide powers with the same base, keep the same base and subtract the exponents.

	Feedback
A	To divide powers with the same base, subtract the exponents.
B	To divide powers with the same base, subtract the exponents.
C	Correct!
D	The bases are the same, so the expression can be simplified.

PTS: 1 DIF: Basic REF: Page 467 OBJ: 7-4.1 Finding Quotients of Powers
 TOP: 7-4 Division Properties of Exponents KEY: exponent | power | division | base

10. ANS: C

To divide powers with the same base, keep the same base and subtract the exponents.

	Feedback
A	To divide powers with the same base, subtract the exponents.
B	The bases are the same, so the expression can be simplified.
C	Correct!
D	To divide powers with the same base, subtract the exponents.

PTS: 1 DIF: Basic REF: Page 467 OBJ: 7-4.1 Finding Quotients of Powers
TOP: 7-4 Division Properties of Exponents KEY: exponent | power | division | base

11. ANS: A

Write as a product of quotients: $\frac{6.3}{9} \times \frac{10^8}{10^4}$.

Simplify each quotient to get 0.7×10^4 . If necessary, adjust the result so it is in scientific notation with exactly one digit to the left of the decimal point.

	Feedback
A	Correct!
B	Check the exponent.
C	Write your answer in scientific notation.
D	Check the exponent.

PTS: 1 DIF: Average REF: Page 468
OBJ: 7-4.2 Dividing Numbers in Scientific Notation NAT: 12.1.1.f
TOP: 7-4 Division Properties of Exponents

12. ANS: D

The standard form is written with the terms in order from highest to lowest degree.

	Feedback
A	The standard form is written with the terms in order from highest to lowest degree.
B	Find the correct coefficient of the x-cubed term.
C	The standard form is written with the terms in order from highest to lowest degree.
D	Correct!

PTS: 1 DIF: Basic REF: Page 477
OBJ: 7-5.3 Writing Polynomials in Standard Form NAT: 12.5.3.d
TOP: 7-5 Polynomials

13. ANS: A

$-16t^2 + 84t + 49$ Substitute 3 for t .
 $= -16(3)^2 + 84(3) + 49$ Simplify. Begin by raising 3 to the power of 2.
 $= -144 + 252 + 49$
 $= 157$

The rocket will be 157 feet above the ground after 3 seconds.

	Feedback
A	Correct!
B	First, substitute 3 for t . Then, evaluate the polynomial.
C	Evaluate the polynomial by using the order of operations.
D	Be sure to include the last term of the polynomial.

PTS: 1 DIF: Average REF: Page 478 OBJ: 7-5.5 Application
 NAT: 12.5.3.c TOP: 7-5 Polynomials

14. ANS: D

$$(10a^3 - a) - (a^3 + 7a - 2)$$

$$= (10a^3 - a) + (-a^3 - 7a + 2)$$

$$= (10a^3 - a^3) + (-a - 7a) + (2)$$

$$= 9a^3 - 8a + 2$$

Rewrite subtraction as addition of the opposite.

Identify like terms. Rearrange terms to get like terms together.

Combine like terms.

	Feedback
A	First, rewrite the subtraction as an addition of the opposite. Then, combine the like terms.
B	Check that you have included all the terms.
C	Check the coefficients and the signs.
D	Correct!

PTS: 1 DIF: Average REF: Page 485 OBJ: 7-6.3 Subtracting Polynomials
 NAT: 12.5.3.c TOP: 7-6 Adding and Subtracting Polynomials

15. ANS: D

$$\left(\frac{2}{3}\right)(6)(x^3x^2)(r^2r^4)(s^4s^3)$$

$$4x^5r^6s^7$$

Rearrange the terms to group like bases.

To multiply powers, add the exponents.

	Feedback
A	To find the coefficient, multiply the fraction by the whole number.
B	To find the coefficient, multiply the fraction by the whole number. To find the product of two powers with the same base, add the exponents.
C	To find the product of two powers with the same base, add the exponents.
D	Correct!

PTS: 1 DIF: Advanced REF: Page 492 OBJ: 7-7.1 Multiplying Monomials
 NAT: 12.5.3.c TOP: 7-7 Multiplying Polynomials

16. ANS: D

Use the Distributive Property to multiply the monomial by each term inside the parentheses. Group terms to get like bases together, and then multiply.

	Feedback
A	Don't forget to multiply the coefficients for each term.
B	When multiplying like bases, add the exponents.
C	Multiply the coefficients for each term; don't add.
D	Correct!

PTS: 1 DIF: Advanced REF: Page 492
 OBJ: 7-7.2 Multiplying a Polynomial by a Monomial NAT: 12.5.3.c
 TOP: 7-7 Multiplying Polynomials

17. ANS: D

Use the Distributive Property to multiply the monomial by each term inside the parentheses. Group terms to get like bases together, and then multiply.

	Feedback
A	Multiply the coefficients for each term; don't add.
B	Don't forget to multiply the coefficients for each term.
C	When multiplying like bases, add the exponents.
D	Correct!

PTS: 1 DIF: Advanced REF: Page 492

OBJ: 7-7.2 Multiplying a Polynomial by a Monomial

NAT: 12.5.3.c

TOP: 7-7 Multiplying Polynomials

18. ANS: A

Use the Distributive Property to multiply the monomial by each term inside the parentheses. Group terms to get like bases together, and then multiply.

	Feedback
A	Correct!
B	Multiply the coefficients for each term; don't add.
C	When multiplying like bases, add the exponents.
D	Don't forget to multiply the coefficients for each term.

PTS: 1 DIF: Advanced REF: Page 492

OBJ: 7-7.2 Multiplying a Polynomial by a Monomial

NAT: 12.5.3.c

TOP: 7-7 Multiplying Polynomials

19. ANS: C

Method 1

$$(a + b)^2 = \underline{a^2} + 2ab + b^2$$

The factors fit the pattern for squaring a binomial to get a perfect square trinomial. Use the rule for $(a + b)^2$.

$$a = 3x \text{ and } b = 2y$$

Identify a and b from the given binomial.

$$a^2 = 9x^2$$

Use these values to determine a^2 , $2ab$, and b^2 .

$$2ab = 12xy$$

$$b^2 = 4y^2$$

Substitute the terms into the corresponding places.

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(3x + 2y)^2 = 9x^2 + 12xy + 4y^2$$

Method 2

$$(3x + 2y)^2 = (3x + 2y)(3x + 2y)$$

Use FOIL to multiply the binomials.

$$= 9x^2 + 6xy + 6xy + 4y^2$$

$$= 9x^2 + 12xy + 4y^2$$

	Feedback
A	Check your multiplication and addition.
B	Rewrite the binomial square as a product of two binomials. Either use FOIL or the rule for squaring a binomial.
C	Correct!
D	Rewrite the binomial square as a product of two binomials. Either use FOIL or the rule for squaring a binomial.

PTS: 1 DIF: Average REF: Page 501

OBJ: 7-8.1 Finding Products in the Form $(a + b)^2$

NAT: 12.5.3.c

TOP: 7-8 Special Products of Binomials

20. ANS: C

$$(y + 10)(y - 10)$$

$$(a + b)(a - b) = a^2 - b^2$$

Use the rule for $(a + b)(a - b)$.

$$(y + 10)(y - 10) = y^2 - 10^2$$

Use the FOIL method, and then combine like terms.

$$y^2 - 100$$

Simplify.

	Feedback
A	First, use the FOIL method. Then, combine the like terms.
B	Use the FOIL method.
C	Correct!
D	The terms in the product should be squares.

PTS: 1 DIF: Basic REF: Page 503

OBJ: 7-8.3 Finding Products in the Form $(a + b)(a - b)$

NAT: 12.5.3.c

TOP: 7-8 Special Products of Binomials